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TEXTILE DEVELOPMENTS IN GERMANY

A MEETING at which reports were presented on textile conditions in Germany was held on October 2nd at the Engineering Societies Building in New York. The meeting was sponsored by the Textile Members of the Advisory Board, Research and Development Branch, Military Planning Division, Office of the Quartermaster General in cooperation with the Inter-Society for Textile Research of which the American Association of Textile Chemists and Colorists is a member. The reports presented are of a preliminary nature. Publication of complete reports will require considerable time.

Following introductory remarks by William D. Appel, Lt. Col. S. J. Kennedy of the Office of the Quartermaster General reported on the scope of the textile investigations. Many government intelligence missions, covering technical developments, have been sent to Germany to make investigations and present reports. Many of the reports have been given and others will follow. As regards textile, Col. Kennedy said, "Although no developments of spectacular importance were to be expected, there was good reason to believe that the Germans had made significant technical progress. Analyses of captured German uniforms and equipment sent to us in a steady stream by observers of our office overseas had shown considerable ingenuity along lines different than were being followed by technologists in this country, in cloth production and finishing as well as in fiber manufacturing and processing."

The first group (under the auspices of the Combined Intelligence Objectives Sub-Committee of the Joint Chiefs of Staff) sent to Germany was given a directive to look for developments of military importance that might be applied to the improvement of Quartermaster textiles for the war in the Pacific. "In recognition of the broader interest of American industry in Germany than would be covered by a strictly military mission, or missions concerned with the investigation of military targets, the Technical Industrial Intelligence Committee was formed," the Colonel reported, "with the broad objective of obtaining technical information relating to every phase of German industry. This committee was set up to operate through 19 sub-committees including one on textiles, the terms of reference of the subcommittee covering all textiles made from natural and synthetic fibers, dyestuffs, tanning materials and processes and leather." A total of 40 representatives covering textiles have been, or are being, sent to Germany with the understanding that they are to act solely in the interests of the Government and would disclose all information.

In closing, Col. Kennedy stated: "In respect to all of the papers being presented today, it is to be distinctly understood that the War Department is merely distributing technical information which has come into its hands from captured German territory. This information should be made available to all U. S. citizens interested in it, but their use of it must be and is at their own risk in so far as the U. S. or foreign patent violations are concerned."

The first speaker was Joseph P. Meierhans of J. P. Stevens & Co. The title of his paper was:

ORGANIZATION AND RESEARCH IN GERMANY

Rayon Staple

Mr. Meierhans reported that the reason for the extraordinary growth of rayon staple in Germany was because the German government encouraged the building of plants. There was a time in the early thirties where the production of staple rayon was considerably bigger than the consumption so the government in Germany issued an order that all cotton and wool fabrics produced must contain not less than 15 per cent of staple rayon, which percentage was increased later on. A large program of research was instigated to put all efforts on 100 per cent rayon staple fabrics wherever possible and feasible. Research in Germany is mostly done by the textile schools. Large research programs were also in progress at the I. G. Farben on dyestuffs, textile chemicals and finishing compounds. For the rayon staple research program a pilot plant was built at Denkendorf which was called "Zellwolle Lehrspinnerei Denkendorf." This plant was equipped with 5,000 cotton spindles and 2,000 worsted spindles and was financed one-third of capital by the Reichstelle (control agency of the government), one-third of capital by the rayon staple producers and one-third of capital by the rayon staple spinners and weavers. Mr. Meierhans' report of research on the immersion suit which follows was of considerable interest:

Immersion Suit

"For quite some time a lot of effort has been directed to the protection of man in cold water. Research has been instigated by various institutions here as well as in England. These efforts were mostly directed towards extremely tight woven fabrics, with a sufficient water repellent finish or coating to keep the water away from the skin of an immersed person. These efforts have gone as far as using clothing made of leather with a waterproof coating, none of which have proven entirely satisfactory. In many cases, persons have died in less than one hour through critical loss of body heat, even after they were taken out of the water alive and immediately put into warm water, by especially constructed life saving boats of the German navy and then wrapped in warm blankets. It was, therefore, most important to devise protective immersion suits.

"This problem was attacked in Germany from a completely different angle than in the U. S. A. or in England. It was thought essential that a suit of cloth-

ing should be constructed which is permeable when the clothing is dry, so as not to hinder the body movements nor to make the wearer uncomfortably hot, and yet, to ena le the person immersed in cold water to survive for many hours, rather than for only a very short time. The fact that this was important can be understood when it is realized that even in the North Sea, the average temperature is plus 4° C. (39° F.) for considerable time in Fall, Winter and Spring. This already is a very critical temperature for immersed persons.

"It was thought that the best way to solve this problem was to build a special suit, in which the cold water which penetrated into the clothing, would be forced out again by a stabilized foam, which develops quickly inside of this protective suit. The loss of body heat to the water, would in this manner be considerably reduced by the air bubbles in the foam. When some of these suits were tried out, it showed, as a matter of fact, that a stay of twenty-four hours in ice cold water with the protection of such a foam suit, was not at all harmful.

"In regard to the construction of the foam, it was necessary to develop a strong and stable foam. From the many investigations of foam formation in cold sea water, it was found that the best result could be obtained with a carbon dioxide-forming mixture of sodium carbonate with an acid. To avoid any body irritation, an organic acid, harmless to the skin, was mixed with bicarbonate in molecular proportion, giving a neutral reaction. The mixture should not be hygroscopic. Citric acid was proven particularly suitable; it dissolves quickly enough in cold sea water, so that a foam develops very rapidly and as it is a tri-basic acid, it gives a high yield, and, therefore, allows a large equivalent quantity of bicarbonate to be worked into the mixture so that a good deal of carbon dioxide can be developed. The best foam medium proved to be a particular Mersolate—type H-30—low in salt content.

"The best formula worked out at I. G. Farben at Hoechst was foam powder No. 4, which contained

24.4% Mersolate H-30 (30% H_2O) low in salt content
41.40% sodium carbonate
34.14% citric acid

Hoechst had orders in 1944 to deliver 30 tons of this powder. The order however, could not be executed on account of transportation difficulties caused by our bombing raids on the transportation system of Germany, which made it impossible to deliver to Hoechst the necessary Mersolate from the Wolfen plant near Leipzig, or the citric acid from Prague. These 30 tons would have made about 15,000 suits.

"Since citric acid and Mersolate were no longer attainable, a new formula had to be developed, which, however, was not as good as foam powder No. 4, but was still sufficiently suitable for such protective suits. This formula was

Foam powder 1-B
24.4% Igepon AP high concentration
30.9% sodium bicarbonate
44.7% benzoic acid

Of this second formula, 4 tons were delivered to the Klepper Werke at Rosenheim. Further production was not possible on account of the occupation of Hoechst by our troops. The first of these immersion suits was made at the Textile School in Munchen-Gladbach, under the supervision of Prof. Dr. Mecheels; additional suits by Klepper at Rosenheim.

" . . . To construct . . . an immersion suit, three layers of cloth were used. On the outside, a filament acetate poplin; next, an acetate plush (called Wollin plusch), with pile towards the outside. Then a viscose filament tightly woven fabric. The acetate did not swell or absorb a lot of water and permitted the sea water to penetrate quickly to the foam powder, which produced foam immediately. The inner layer of viscose did swell and tighten, and kept most of the water away from the body. The foam powder was rubbed into the pile of the plush by hand, at the rate of 4.4 lbs. (2 kilo) per suit."

Mr. Meierhans concluded his paper with a report of parachute research at Parachutes Forschung Institute Graf Zeppelin.

The next paper was presented by M. Earl Heard of West Point Maufacturing Co. The title of his paper was:

THE ZELLWOLLE LEHRSPINNEREI AT DENKENDORF

This plant was referred to in Mr. Meierhans' paper and Mr. Heard went into considerable detail regarding its operation. Of most interest to readers of the REPORTER will be his report on the testing laboratory which follows:

Testing Laboratory

"Germany uses nothing but single fiber tests, as far as we could tell, against our fiber bundle testing. The first system, adopted in January, 1937, and called system DIN (Deutsch Industry Norm), called for five meters of fiber to be tested in three groups and each group cut to 25mm. lengths. For cotton they used ten meters of fibers and three groups. For filament rayon, five meters and three groups, and for bast fiber, ten meters and three groups. The Lehr Spinnerei uses the above method but uses two operators and therefore has six groups. This gives better control. In October, 1940, a slightly modified method was recommended by Fa-Chem-Fa, which is the technical group for the manufacture of chemical fibers. This method called for ten groups of 50 fibers each and was the one largely used by industry. In all testing, both wet and dry tests are made on yarn, fi er and fabric. By dry tests we mean a conditioned test. On fibers the final results of the break in grams is multiplied by the number metric of the fiber and the Reisskilometer is obtained. The same thing is done when testing yarns, and the break times the number metric gives the Reisskilometer so that a percentage yield of strength in the yarn in the fiber can be calculated. We were advised that 55 per cent was a good average strength yield on their rayon yarns.

"No skein tests were used on yarns in Germany as far as we could tell. Card sliver was broken on a single strand machine with special Bakelite jaws to determine the adhesion qualities of the finish on the fiber. This plant worked very closely with the rayon manufacturers to get the best possible finish on all staple fiber. They also had a single fiber abrasion machine, which was developed by Von Ostermann at Salach.

"Another interesting machine was the Frenzyl Hahn machine for testing the number of breaks at a specific elongation. This machine had a variable speed ranging from 5 to 40 meters per minute and a variation in elongation from 0 to 40 per cent. For example, if a single yarn broke at 200 grams and 12 per cent elongation, you could take a bobbin of the yarn to the Frenzyl Hahn machine and run it at 2 per cent elongation, 4, 6, 8, 10 per cent, etc., and record automatically the number of breaks at each elongation.

"All testing machines had a variable speed control, and after a few preliminary breaks the speed control was adjusted in order to obtain a break in approximately 20 seconds. . . . "

The next paper was presented by John F. Hagen of Callaway Mills. The title of his paper was:

GERMAN METHODS FOR UTILIZING UNRETTED FLAX AND HEMP AS A TEXTILE FIBER

Among other items, Mr. Hagen reported on the chemical processes used in place of water retting of flax. The object of the chemical processes is to decompose the pectins and agglutinating substances so as to separate the fibers. There are two principle methods of chemically preparing flax and hemp—the alkaline treatment and a chlorination called the Korte process.

Alkaline Process

In one plant the alkaline process is utilized as follows: The fiber is wet out with circulating hot water for about a

half-hour and then boiled with a caustic soda solution for three hours. Next follow two washes, one in the kier and the other in a rack type wool washer. After hydroextracting, the partly-dried flax or hemp is then run through a hopper opener, after which it passes into an air dryer in which there is a low initial temperature which is gradually raised to a maximum of 70° C. to keep the fibers from getting hard. Thereafter it is mechanically treated to untangle the fiber mass and at the same time do some cleaning. It then passes through several types of openers and finally through saw-toothed surface cylinders where it is straightened and cut so that the final fiber is ready for the cotton spinner.

Chlorinating Process

In the Korte chlorinating process the fiber is usually given a preliminary alkaline boil, rinsed, then treated with a solution containing 2 grams per liter of hydrochloric acid for 8 hours, for 2 to 3 hours of which it must be circulated. It is then rinsed for an hour and the mass of fibers pulled apart to insure uniform circulation in the chlorinating bath which follows. Six to eight per cent of chlorine, based on the weight of the material, is present in the chlorinating bath. The liquor circulates for an hour. It is followed by rinsing and neutralization with an alkaline sodium bisulfite solution. The fiber is again rinsed and packed into a kier in which the final chemical treatment, consisting of an alkaline pressure boil containing 9 grams of caustic soda and 2 grams of sodium sulfite per liter, is given. This treatment lasts from 6 to 8 hours. There follows three hours of rinsing, first with hot then with cold water. The fiber is then hydroextracted and run through a porcupine beater section to separate the wet matted fiber into small bunches for the dryer. Thereafter the drying and mechanical operations are about the same as described above.

The chlorinating process gives a better separation of the fibers, a cleaner yarn, free of woody particles and a softer and finer yarn.

The next paper was presented by Frank S. Richardson of the Waldrich Company. The title of his paper was:

AN INVESTIGATION OF THE TEXTILE DYEING AND PRINTING INDUSTRY IN GERMANY

Shelter Half

One of the items of unusual interest which Mr. Richardson reported was the shelter half which had been camouflaged, printed and made in such a manner that it could be used as a poncho. The latest ones were made entirely from spun rayon and tests showed that they possessed a very high degree of water repellency and abrasion resistance. The water repellency was further enhanced by the fact that when the cloth finally became wet, a swelling of the yarn took place which rendered the cloth water tight for a considerable period of time. Further remarks of Mr. Richardson regarding the shelter half follow:

"Originally the shelter half material had been made of all cotton, but as German supplies of cotton became less, 33 per cent of staple rayon fiber was introduced. This blend was continued for some time and then as cotton became practically unobtainable the cloth was made of one hundred per cent spun rayon.

"All of it was printed with camouflage patterns. The German army has experimented with camouflage printed fabrics a great deal and for many years. The standard army pattern was first adopted in 1932 and was in use from then until the early stages of the war. A modification was then made which consisted of softening the edges of each object making them fuzzy, rather than sharp and distinct. A further alteration of the same kind was made later, to the extent that the colors tended to blend into each other or into the ground. Changes in color combinations were also made at the same time design changes were effected.

"When the SS came into being, they produced and adopted a pattern of their own which differed considerably from the army one. This SS pattern was also modified slightly during the war. About the first of 1945 an entirely new pattern was brought out by the SS and it was also adopted by the army for shelter halves and jackets. Considerable yardage of this new pattern was printed but as far as could be ascertained never reached the field.

"The cloth, printed with the older patterns, usually had a green combination on one side and a brown one on the other. Material to be used on the Russian front was printed with the green combination on one side and the other side left white. This particular job was very well done in that the white side showed no indication of the print on the other. Of course some mills produced better results than others in this regard, but on the whole the work was an excellent illustration of one phase of the printers art.

"The new pattern had only one color combination and the cloth was printed on one side.

"The pattern had a black object in it, which was printed from two print rollers of varying circumferences. This was done to produce a design which had no definite repeat. The black was printed with aniline black and the cloth was usually printed with the black first, given a rapid ageing and over printed with the other colors. Vats and Indigosols were used for the red, green, brown and tan.

"A great deal of testing was done to establish the best combination of dyes as far as the infra red sensitivity was concerned. For a long while the green color was very poor in this regard. I. G. Farben finally found that one of the oldest Hydron colors gave excellent results. This was Hydron Green GX, a very poor printing color because they had never been able to disperse it properly for printing. This defect was overcome and the use of it required by the army for all camouflage prints. This dispersing medium has very interesting possibilities and is being investigated by the chemical team of investigators.

"After ageing, washing, and drying the fabric was given a water repellent finish."

Water Repellents

Mr. Richardson reported further that I. G. had produced the Persistol brands of water repellent agents. The first of the brands were wax emulsions which, instead of employing aluminum salts, were used in conjunction with zirconium oxychloride. Repellency was said to be increased and permanency to washing greatly improved. Further research developed that ethylamine chains were of particular interest as water repellent and crease resistant or shrinkage control compounds.

Parachute Cloth

Many other articles other than shelter halves were also dyed or printed with their camouflage effect as the prime consideration. Among them were field jackets, paper twine netting and nets of hemp or spun glass. "Nylon parachute cloth," Mr. Richardson said, "was printed on a special print machine. This was necessary because the repeat of the pattern was so large that special wooden rollers were used. The pattern was cut into a rubber sheet which was fastened around the wooden rolls. The raised portions of the pattern applied the color to the cloth. A water thin paste was used and the goods were dried and steamed. No washing after steaming was employed and, as little gum had been used, the air permeability was practically unaffected. Fabrics which were coated and used in gas masks were also printed with the standard patterns. In all cases, except in the case of nylon parachute cloth, vats or the indigosol type of dyes were used."

Civilian Fabrics

Printed fabrics for civilians were turned out up until the end of the war. Bemberg sheers, filament rayon crepes, flat crepes

and spun rayons were available. All plants gave up more than half of their copper rolls and in place used iron core rolls with a three millimeter layer of copper on the surface. Coverage and number of colors were restricted. Dyestuffs were not rationed and while not plentiful there was sufficient. Much of the export business was cut off but they continued to ship merchandise to Switzerland and Sweden. The dyeing of work clothes was omitted during the last year of the war, due, not to a scarcity of color, but to a scarcity of fuel. All industries had to conserve fuel as much as possible and in the dyeing and printing plants the number of times a fabric had to be dried was held to a minimum.

Resins

Mr. Richardson further reported that extensive research work was carried on in the field of non-swelling agents. These included the use of formaldehyde alone, the urea and melamine formaldehyde resins and a late development from the same base as the latest water repellents. "This last resin," Mr. Richardson said, "worked out as far as pilot plant production, could be cured at a temperature around 175° F. It was compatible with the water repellent product and therefore it was possible to produce a water repellent and crease-resistant finish in one operation.

"The latest resin development is of great interest because of its low curing temperature. It would be wise, however, to consider it purely as an interesting experiment until such times as manufacturing procedures and performance qualities have been evaluated."

Auxiliaries

Considerable research work was done on detergents, emulsifiers, water softeners and other products in the auxiliary field.

Deterioration of Cellulose

A study was conducted on the failure of cellulose fabrics to withstand repeated launderings. It was found that the deterioration of fabrics, especially rayons in laundering, was due to a solubilizing of the cellulose by free oxygen in the presence of metal salts in the water.

Scouring Rayons

A radically different step was noted in the boil-off or scouring of rayons: practically every yard was given a chlorine bleach. In one mill the following set-up was observed: *For crepes and sheers*—a full width impregnation tank in which the cloth was treated with caustic followed by a rope wash, chlorine bleach, anti-chlor, three soapings and a hot and cold water rinsing. Active chlorine content was held to one-half per cent.

Cotton Preparatory Processes

In general cotton preparatory processes were standard. It was noted, however, that all mercerizing of cotton was done on the chainless type of machine.

Dyeing

Cotton and rayon dyeing for military purposes was almost always done with vats and sulfur colors. More civilian items of cotton and synthetics are dyed with vats in Germany than here. Vats are either jig-dyed or pad-jig dyed. No evidence of continuous vat dyeing was noticed. Extensive use is made of the water soluble type of vats. A large number of fully automatic jigs were in use. Dye reels for rayon were of standard construction but not many were stainless-steel although this type was considered the best. The drying of fabrics, both cotton and rayon, is largely done on dry box enclosed frames, many of the frames being pin frames. Great care is exercised in the drying of rayon to control the heat as it is felt that a temperature above 222° F. has a damaging effect on the fiber or filament, affects the hand and causes a loss in strength.

Printing

Printing is an important and well developed part of the industry. Printing machines are standard with very large spider type dry boxes in order to dry at the reduced temperature. More extensive use of photo-engraved rolls than in this country was evident. One ager, using a spider arrangement of rollers, was described by Mr. Richardson as follows: "The cloth formed a box around the outer rolls and progressed inward, actually forming a skein with the rolls between each lap. When the fabric reached the center, it passed over a roller set at a 45° angle and came out of the side of the ager. In this manner only the back of the cloth comes in contact with the rolls.

"Another type which was used for crepes," Mr. Richardson continued, "had a set of carrying rolls between the top and bottom ones and set off center, so the cloth ran at a slight angle between rolls. Therefore there was only a short distance between rolls and any tendency to form creases was minimized. This ager was also separated into three sections with compensators between sections controlling individual motor drives for each section. Elongation or shrinkage of the fabric in the steam atmosphere was taken care of in this manner."

Print washers were regular full width or open types.

Finishing

The use of resin finishes was not taken up by the mills to any great extent. Finishing operations, in general, were pretty much the same as in this country. Mills were generally well equipped and well operated, emphasis being placed on the execution of the printing.

New Dyestuffs

A new line of dyes, primarily developed for printing on acetates, were called "Astrasons." They were reported to have a brilliance equal to the bright basic colors, to be fast to washing and to have good-to-excellent fastness to light.

Mr. Richardson concluded by saying: "The investigations which have been carried out, and those pending, would indicate that much valuable information, both of a military and civilian nature, had been and will be acquired."

The next paper was presented by Werner von Bergen of Forstmann Woolen Co. who spoke on:

WOOLEN AND WORSTED INDUSTRIES IN GERMANY

Mr. von Bergen reported that before the war the German woolen and worsted industry was nearly twice the size of our own. While some plants were almost entirely destroyed, and in some cities the average destruction may have run as high as 50 per cent, the destruction of the woolen mills was generally small because most of these mills were situated in smaller cities where bombing was not excessive.

Uniform Cloth

The main woolen fabric produced in Germany during the war was the standard uniform cloth (Einheitstuch). This was a 24 to 25 ounce fabric of the melton type, 56 in. wide, 42 ends and 47 picks per inch finished cloth. The warp was a 2 ply yarn consisting of single 33 worsted and single 3.1 run woolen yarn and the filling was a single 2.8 run woolen yarn. The weave was a 2/2 reversed twill. The fabric was used for both uniforms and overcoats. The cloth degenerated from a 100 per cent wool in 1934 to a shoddy fabric containing approximately 30 per cent wool, 30 per cent mill wastes and reworked wools, and 40 per cent rayon staple fiber. The quality of the wool used became coarser as the war progressed. When no viscose type staple was available, cuprammonium rayon and acetate rayon were used. The main shades were field-gray (the most important), marine-blue, black, earth-brown, olive, and a gray for the medical caps. The original shade of 1940 was changed from a greenish-gray to a brown-gray in 1944 because of the poor camouflage effect of the

original color in the early morning and late afternoon light.

The studies made on the manufacturing procedure of the standard uniform cloth were used by Mr. von Bergen as a basis to discuss the various developments in materials, manufacturing processes and machinery. Among other items covered are those in the following paragraphs:

Wool Scouring

In regard to wool scouring, Mr. von Bergen reported: "All German mills used the soap-soda process. No special new machinery was in evidence. The German government, well aware of the importance of wool grease in war time, had issued orders that only those plants with grease recovery equipment be allowed to scour wool. At the outbreak of the war the wool grease production was confined to three large combing plants in North Germany. Their normal production of grease amounted to approximately 12 million pounds annually. All three plants treated their scouring liquor with acid and the separated grease was then recovered with naphtha. Two of the plants refined the grease further for pure lanolin, wool grease fatty acids and various wool waxes. The Hanover plant was probably the best equipped plant in this field. In addition to the grease recovery all three plants recovered the potassium salts from the raw wool, producing what is known as the wool-suint ash. The Bremer plant further refined this ash, producing C. P. potassium carbonate." Smaller plants installed grease recovery systems during the war. A further by-product of the plants using the acid and solvent process for recovery was fertilizer.

Dyeing

"The dyeing of the uniform cloth was done in the stock for the woolen yarns and in the top form for the worsted yarns," Mr. von Bergen said. "The wool was dyed with vat colors, Helindone type, whereas in top dyeing chrome colors were used. The reason was that the dyers found it too difficult to apply the vat colors in a customary top dyeing machine.

"The reworked wool portion was dyed with chrome dyes, on account of the tanning effect produced through the chrome. Rayon staple fibers could be either dyed with vat or sulfur colors, or spun dyed. Towards the end of the war, there was no more pure wool waste available and as straight chrome dyes have no affinity toward the rayon staple fibers, the dyers had to use dyes which had affinity for both, animal as well as cellulose fibers. The I. G. Farbwerke for this purpose brought on the market Half Wool Metachrome dyes, a mixture of metachrome dyes and cotton dyes, resistant to chrome. I. G. Farbwerke also suggested the use of their Immedial leuco dyes which are soluble sulfur colors. All mills visited used high grade stainless steel dye equipment of the conventional type. One mill visited was found to use the hot water system, heating all the dye kettles indirectly."

Finishing

As regards finishing, Mr. von Bergen reported no extraordinary procedures or new types of machinery. "The only process which is of importance," he said, "is the water repellent treatment they had to give the standard army cloth. With the increased amount of rayon staple fibers in the uniform cloth, the deficiency of these fibers in regard to their ease of wetting-out and their high water absorbency came into play. The "Wehrmacht" in 1941 started to make extensive studies to increase the hydrophobic properties of rayon. The main research was done by I. G. Farben with the result that they produced some excellent water repellent compounds, known as Persistols. From 1943 on the water repellent treatment was made compulsory for the standard uniform cloth. All the mills visited used in place of the Persistol, which was no longer available, wax emulsions combined with aluminum formate . . . "

Non-felting Process

The wet chlorination process was used for a non-felting treatment of army socks. This was the only German specification calling for a non-felting treatment.

Use of Other Fibers

Other fibers used included Tiolan (a casein fiber) in the winterboot felt (10 per cent); saddle blanket (10 per cent) and civilian wool blankets (5 per cent). Perlon, the German nylon fiber, was specified to be used in the foot of the army sock in the 1943 specification (13 per cent) but was removed in 1944 due to shortage. Angora rabbit hair was specified for aviators' underwear. The blend was: 50 per cent angora rabbit hair, first grade, 20 per cent wool and 30 per cent rayon staple.

Mothproofing

"Even though mothproofing originated in Germany," Mr. von Bergen stated, "the only item the German army insisted upon mothproofing was the underwear for the air force. Probably the main reason was the high percentage of rabbit hair used in this blend which, because of its fineness is an excellent feeding ground for the moth. Also this item was expensive and needed all possible protection. Eulan CNA of I. G. Farben was the principal product used. . . . "

Mildewproofing

Mildewproofing was not considered to be a problem by the German army. Nuesslein and Jackel of I. G. Farben at Hoechst did some work in this field. They made an extensive investigation of Protectol MT which seemed to have outstanding antiseptic properties.

Microscopy

"In textile microscopy German scientists have always played a leading role," according to Mr. von Bergen. "In recent years the three top men in this field were Prof. A. Herzog, Dresden, Prof. Dr. Koch, Dresden and Dr. H. Reumuth of Hoechst. Whereas the first two have specialized mainly in the field on vegetable fibers, Reumuth's principal field was wool microscopy. During the war years he did some excellent work on the action of soaps, oils and detergents on all fibers. The structure of bast fibers in connection with the "Flockenbast" program was studied. All new fibers produced by I. G. Farben and their competitors were studied in this laboratory. One outstanding example of microscopic research was the study on the life cycle of the moth and exactly how damage occurs.

"The microscopic laboratory at Hoechst is probably the best equipped textile laboratory of its kind in the world. One reason for this is that Reumuth was a consultant for Zeiss and was therefore directly responsible for new developments and publication in the field of textile microscopy. Of special interest is the use of the phase-contrast method for bringing out more clearly the detailed structure of fibers, emulsions, soaps and other colloidal solutions."

Testing

Most of the woolen mills visited had their own laboratories, mainly for control work. At the laboratory of Schachenmyer & Mann, Von Ostermann, the manager of the company, developed testing methods to evaluate the quality of knitting yarns. Concerning this, Mr. von Bergen reported: "The interesting and valuable point regarding this method is that Von Ostermann continually evaluated his laboratory tests against actual wear tests and on the basis of actual performance and many hundreds of tests during the last six years, he has established standard tests with weighted values for each test, using the material that gave the highest value as 100 per cent. The tests used are dry strength, wet strength, relation of wet to dry strength, flexing, dry abrasion, wet abrasion, knitting abrasion, knitting abrasion after boiling the yarn, and the swelling value of the fiber.

"With the weighted values obtained from any particular blend of fibers put through these tests, von Ostermann was able to predict with reasonable accuracy

the number of days of wear of the socks made from this blend. Based on his research, von Ostermann feels that the ideal fiber mixture for socks is 40 per cent wool for comfort and warmth, 30 per cent nylon for strength, and abrasion, and 30 per cent acetate to eliminate the felting action."

The final paper of the session was presented by Lloyd L. Leach of E. I. du Pont de Nemours & Co., Inc. The title of his paper was:

GERMAN MANUFACTURE OF CONTINUOUS AND STAPLE FIBERS AND RELATED PRODUCTS

Twenty-three plants and two large research organizations were visited by a combined intelligence objectives sub-committee, an arm of the combined Anglo-American Chiefs of Staff, composed of one representative from each of five different British and American rayon companies. They investigated rayon, staple, and other synthetic fiber plants of Germany. Mr. Leach presented a report covering the manufacturing processes of cellulose acetate, cuprammonium and viscose. Among the items he covered were: pulp manufacture, slurry steeping and continuous pressing, continuous ageing, xanthater-mixing, staple spinning, staple purification, carbon bisulfide recovery and manufacture, torntow, Vistra XT, Lanusa-Telusa, hollow filament staple, Floxalan, yarn washing, tension drying of cord, two-for-one twisters and KKK evaporators.

As regards wholly synthetic fibers Mr. Leach reported that the development of polyamides and fibers from them has progressed very slowly in Germany. The maximum attained rate of production for Perlon L was 3,500,000 pounds per year and about 1,000,000 pounds per year of Perlon bristles. This rate is small in comparison with the polyamide fiber production in other countries. However, it is to be considered that Germany had access to silk during the war and could meet some of its needs more quickly with that fiber. On the mechanical side of high-polymer-fiber production, no improvement over the equipment of the late thirties was noted. In regard to Pe Ce fiber, Mr. Leach said: "I. G.'s after-chlorinated polyvinyl chloride fibers represent a much older development. By 1944, production at Wolfen had increased to about 4,000,000 pounds per year with bristle manufacture (made from polyvinyl chloride, not after-chlorinated) at 1,500,000 pounds per year."

In regard to finishes and water repellents, Mr. Leach reported: "The preferred finishes for rayon and staple in Germany appear to be I. G.'s Soromins. The Soromins SG, AF, AF Base Z, and AF Base K are derived from ethylene oxide. Soromin FL is from stearic acid and a mixture of polyamines.

"At Schwarza mention was made of the favorable action of dimethyl paracresol on laundering resistance. It was claimed to reduce swelling value from 100 to 50 without loss of elasticity or strength.

"The I. G. trade name Persistol covers a wide range of materials from hexamethylene dimethylene diurea to combinations of paraffin with zirconium oxychloride."

Determination of NITROGEN IN TEXTILES*

SOLOMON FRANKFURT

Pacific Mills Research Laboratory, Cotton and Rayon Division, East Newark, N. J.

THE modification of the Kjeldahl method for the determination of nitrogen described herein is adapted to the requirements of the research work of Pacific Mills Research Laboratory for testing the treatment of fabrics with different nitrogen compounds. This method has the advantage of being simple to handle and easy to adjust for different samples containing varying amounts of nitrogen. It yields satisfactory results when the content of nitrogen is low or when its distribution is not uniform. The determination can be made in a short time, and parallel analysis can be repeated without making a new digestion.

A complete survey of the methods described in the literature has been made by R. B. Bradstreet.[1]

The outcome of the analysis depends in great part on the choice of the catalyst.

A study of the use of perchloric acid as a catalyst was made by L. P. Pepkowitz and his collaborators.[2] From their paper it can be seen that in using this compound caution must be exercised because of its explosive nature and the possibility of the oxidation of ammonia to nitrogen. The time needed for the digestion is given as 20-25 minutes, with a 10-minute interval for cooling. The use of a copper selenite catalyst is simpler and the time of digestion is shorter.

In the chemical laboratory of Pacific Mills, the Kjeldahl method is used for the determination of nitrogen in cotton fabrics, often on a multiplicity of samples. Experience has shown that the fabric material is not homogeneous, and that the content of nitrogen is usually low. This explains why larger samples and standard solutions of low normality must be used to increase the precision of the determination. In reading the volume of the burettes, a difference of only 0.1 milliliter of a 0.1N solution corresponds to 1.0 milliliter of an 0.01N solution.

APPARATUS

The apparatus (Figure 1) consists of a Kjeldahl flask (a) of about 250-milliliter capacity. This flask is attached to a glass funnel (b) with a ground-glass stopcock. The tube of the funnel (c) leads to the bottom of the flask. This tube extends through a spherical bulb (d) that is connected with the flask through a carefully ground joint (e). From this bulb a widened tube (f) leads to the Alling condenser (g) (which affords sufficient length and prevents sucking back of the liquid from the receiver to the digestion flask) by means of a bent tube to which a rubber stopper is attached. The bulk and attached connection tube serve as a trap for the alkali that can be carried from the flask while the distillation with the sodium hydroxide is taking place. At the end of the condenser is a glass tube which leads the distillate to the bottom of the receiver (h), which consists of a 250-milliliter Erlenmeyer flask.

Pipettes of 50-milliliter capacity are used for measuring the aliquot portions into the flasks for distillation.

PROCEDURE

An average sample of about 2.7-2.8 grams is put into a weighing bottle which has a ground-glass cover. It is then dried in an oven at 105° C., placed in a desiccator to cool, and weighed. The dry weight of the sample should be about 2.5-2.6 grams. The sample is then put into a Kjeldahl flask, and 5 grams of the

* Reprinted from "Textile Research Journal," August, 1945.

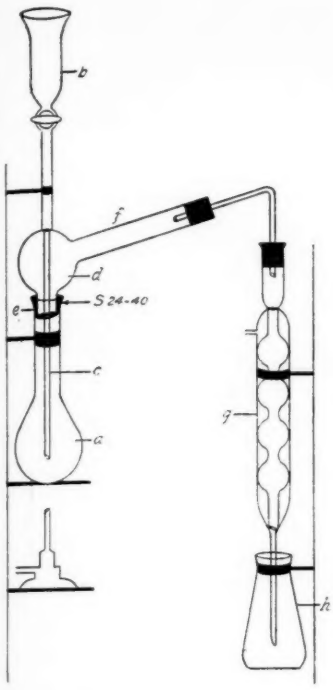

Fig. 1. Apparatus for determining the amount of nitrogen in textile materials by a modification of the Kjeldahl method.

copper selenite catalyst are added. The latter is prepared by mixing carefully 90 grams of potassium sulfate powder with 10 grams of copper selenite. A grain of paraffin is also added to prevent foaming in order to smooth the digestion process. To the contents of the flask are added about 25 milliliters of concentrated sulfuric acid, and the flask is shaken gently until the acid penetrates the whole sample. The flask is then placed on the metal stand in a hood over the full flame of a gas burner. After 5-7 minutes, the contents of the flask begin to boil vigorously, and after 12-15 minutes they turn a clear green color tinged with blue. A short time after the heating has ceased, the flask is cooled sufficiently so that it may be put into a beaker of cold water. The contents of the flask are then diluted to the correct volume for the amount of nitrogen present in the original sample. If the amount is 0.2 per cent or more, the solution is diluted to 1,000 milliliters; when it is less than 0.2 per cent, the solution is diluted to 500 milliliters.

Fifty milliliters of the solution are then pipetted back into the original Kjeldahl flask. To be sure that the required amount of sodium hydroxide is added, a few drops of phenolphthalein indicator are put into the flask. To insure quiet boiling, a small piece of zinc, which releases hydrogen from boiling alkali, is introduced.

The flask is then attached to the distillation apparatus described above. Care must be taken to insure the tight joining of the ground-glass parts. Vaseline is used as a lubricant to attain tight joining, and also to prevent the joints from "freezing." The sodium hydroxide (5 per cent solution) is then run through the funnel into the flask, until the contents of the flask becomes a clear pink color. A great excess of alkali should be avoided, since in reacting the zinc can cause strong eruption of foam. The amount of sodium hydroxide to be added depends upon the acidity of the solution. The amount needed for neutralization of the acid used in digestion is about 10 grams for 50 milliliters of the solution pipetted from the 500-milliliter dilution, and 5 grams for the solution diluted to one liter (or about 50 milliliters of 20 per cent or 10 per cent, respectively, for each solution). As a considerable part of the sulfuric acid is lost following the decomposition and evaporation, there is an excess of alkali, which should be controlled as much as possible. The phenolphthalein indicator helps to regulate the volume of the alkali to be added; about 75 milliliters will be sufficient.

The total volume of the solution in the flask will be about 125 milliliters. Before the flask is joined to the condenser, 25 milliliters of the 0.01N sulfuric acid are put into the Erlenmeyer flask beneath the condenser. The tip of the condenser is placed under the level of the liquid. The distillation can then proceed with full force until half of the liquid in the flask has distilled over into the receiver, which will contain 60-70 milliliters of solution when the distillation is completed.

This process takes about 10-15 minutes. Next, the receiver is lowered so that the end of the tube is above the surface of the liquid. The boiling is continued for a few minutes in order to wash down the condenser with the condensed steam.

Methyl red is used as an indicator with the acid in the receiver, and the liquid must remain red until the end of the distillation. Before retitration with diluted alkali, the solution in the receiver is heated to boiling in order to eliminate any carbon dioxide which may be in the solution.

The described way of using diluted standard solutions 0.01N and the dilution of the liquid resulting from the process of digestion has the following advantages:

1. It is possible to adjust the aliquot portion taken for distillation to the amount of nitrogen present in the sample.
2. In case a repetition of the distillation process is advisable, it may be made without repeating the digestion process.
3. The distiliation of the diluted solutions proceeds smoothly.
4. The amount of sodium hydroxide needed is reduced to 10 or 5 per cent.
5. The time needed for completing one determination is about 30 minutes, and two parallel determinations may be made at the same time without any difficulty; or four determinations may be made in one hour. Therefore it is possible to make 25-30 determinations per day.
6. That the results are precise and that the parallel analyses yield uniform results may be seen from Table I.

The procedure described here was emploied in the analysis of cotton samples. It may be easily adjusted to other materials, with the use of the same apparatus, the same dilution of digested solution, and the same standard solutions. Aliquot portions of the liquid resulting from digestion and dilution may also be used, as is explained above.

TABLE I.

Sample No.	*Sample Weight*	*Dilution After Digestion*	*Mls. Taken for Distillation*	*Per cent Nitrogen*
A 142	1.8503 grams	Whole solution	Whole solution	0.090
A 142	1.8475 grams	Whole solution	Whole solution	0.092
A 128	2.1175 grams	Whole solution	Whole solution	0.076
A 128	2.1191 grams	Whole solution	Whole solution	0.078
35 W	1.9758 grams	Diluted to 1 liter	50 mls.	0.240
35 W	1.9648 grams	Diluted to 1 liter	50 mls.	0.240
47-2	1.8946 grams	Diluted to 1 liter	50 mls.	0.147
47-2	2.5265 grams	Diluted to 1 liter	50 mls.	0.144
1021-50	1.0293 grams	Diluted to 1 liter	50 mls.	4.10
1021-50	1.0188 grams	Diluted to 1 liter	50 mls.	4.10

LITERATURE CITED

[1] Bradstreet, R. B., Chemical Review *27*, 331 (1940).
[2] Pepkowitz, L. P., et. al., Industrial and Engineering Chemistry, Analytical Edition *14*, 856-914 (1942).

VICTORY LOAN

BOOK REVIEWS

TIME STUDY AND MOTION ECONOMY FOR SUPERVISORS

By James D. Shevlin with many charts, diagrams and illustrations. 75 pages. Published by National Foremen's Institute, Inc., Deep River, Conn. 1945. Price $2.00.

This book is dedicated to the Disabled Veterans of World War II with the hope that better methods may make jobs for them. It is believed that it will help the foremen in developing new and improved methods which will make work easier and safer for his men, and lead to the production of more and better products in less time. It will also aid in the development of the foremen into a manager in name as well as in salary.

All of the theories and applications of time and motion study are explained in such a graphic way, and so thoroughly illustrated with diagrams and specimen forms, that the principles involved should be readily understandable to the reader.

THE CHEMICAL FORMULARY

A Collection of Valuable, Timely, Practical Commercial Formulae and Recipes for Making Thousands of Products in Many Fields of Industry. Volume VII. H. Bennett, Editor-in-Chief. 474 pages. Price $6.00. Chemical Publishing Co., Inc., Brooklyn, N. Y. 1945.

The previous six volumes have already been reviewed in the Dyestuff Reporter. All the formulae in any of the seven volumes are different. There is no duplication or revision in succeeding volumes.

In this Volume VII additional new formulae have been introduced which will broaden and bring up-to-date the contents of the previous six volumes.

Chapters are devoted to Adhesives, Flavors and Beverages, Cosmetic and Drug Products, Emulsions and Colloids, Farm and Garden Specialties, Food Products, Inks and Marking Substances, Skins—Leather and Fur, Lubricants and Oils, Materials of Construction, Metals and Alloys, Paint Varnish, Lacquer and Other Coatings, Paper, Photography, Polishes, Pyrotechnics and Explosives, Plastics, Resins, Rubber, Wax, Soap and Cleaners, Textiles and Fibers and Miscellaneous.

An index of more than twenty pages, fully cross-referenced adds to the utility of this encyclopedia of formulae and recipes.

Schools and colleges in increasing numbers seem to find it advisable to use the Chemical Formulary as an aid in promoting a practical interest in chemistry. By its use, students learn to make cosmetics, inks, polishes, insecticides, paints and countless other products. The result is that chemistry becomes an extremely interesting practical and useful subject. This interest often continues even when the students reach the theoretical or more difficult phases of chemistry.

Since some mature users of this book have not had the good fortune to have had previous training or experience in the art of chemical compounding, the simple introductory chapter of directions and advice has been repeated. This chapter should be studied carefully by all beginners (and some more experienced workers) and some of the preparations given in it should be made before attempting to duplicate the more complex formulae in the succeeding chapters.

NEW MANUAL TO MAKE JOB SAFETY TRAINING EFFECTIVE

By Kenneth L. Faist and Stanton M. Newkirk. National Foremen's Institute, Inc., Deep River, Conn. Price $5.00.

This Job Safety Training Manual provides a brief, intensive training program for foremen and supervisors composed of five two-hour sessions. Simple and basic, yet it contains a practical technique for the prevention of accidents that is applicable to every type of job.

The method developed is based on the training methods used by Training Within Industry (TWI) programs. JST (Job Safety Training), is an application of these same principles to safety teaching.

The manual is the outcome of the author's own practical experience in giving many JST programs. Kenneth L. Faist and Stanton M. Newkirk who prepared the manual are connected with the Champion Paper & Fiber Co. as Safety Director and Personnel Director. Their technique of safety instruction has already been used in several plants and the results of numerous conference sessions are incorporated in their text.

The manual is organized to serve as a working tool in conducting JST sessions. It provides everything the conference leader needs to carry out a plantwise safety training program. It contains, too, a plan for continued post-session safety instruction. Supplementary materials for job safety education are carefully linked with the program. Both foremen and workers receive materials which grow out of training sessions and are geared to their own practical needs. All training sessions are based on actual cases provided by participating members. Supplements included with the manual are used at specific points in the training sessions to deepen, enlarge and fix as a part of his job safety pattern, the technique of safety the participant has himself demonstrated visually, orally and manually during his JST instruction.

THE MEASUREMENT OF COLOUR

By W. D. Wright, A.R.C.S., D.Sc. Technical Optics Section, Imperial College of Science and Technology. 223 pages, 65 figures (some in color). Published by Adam Hilger, Ltd., 96 St. Pancras Way, Camden, Road, London, N.W. I. 1945. Price 30s net (Postage 9d extra).

The text of this book published under the guidance of one of the world's most celebrated manufacturers of high grade optical instruments may certainly be classified as authentic.

In this book Dr. Wright has given a comprehensive but concise account of the principles and methods of colour measurement and specification, matters of increasing importance in several branches of science and industry. Dr. Wright has himself been engaged for many years on research at the Imperial College of Science into various problems of colour vision and colour measurement and the results of some of his earlier work were incorporated in the data adopted by the Commission Internationale de l'Éclairage to define the colour matching characteristics of the standard observer for colorimetry. Visual and photo-electric instruments are described in the book, as well as the relation of colour physics to many technical processes.

HOW TO TRAIN YOUR ASSISTANTS

By Richard W. Wetherill. 20 pages. Published by National Foremen's Institute, Inc., Deep River, Conn. 1945. Price 25 cents.

This booklet is upon the subject of "Turning manpower into brain power." The formula was developed during more than fifteen years of experience in training men and women from all branches of business and industry and from all sorts of positions in every walk of life.

The whole subject of "How to Train Your Assistants" is considered in five well described steps, each having an appropriate illustration.

THE PIRATES WILL GET YOU

By Sylvan Gotshall and Alfred Lief. One of the American Business Problems Series. Published by Columbia University Press. New York. 103 pages. Price $2.00.

Here is a timely book on the old problem of design piracy which will again

(Concluded on Page 429)

Proceedings of the
American Association of Textile Chemists and Colorists

OCTOBER 22, 1945

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STUDENT CHAPTERS

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Members should notify the Secretary immediately of all address changes

VICTORY CONVENTION

THE Council approved at its last meeting, on October 5th, the holding of a victory convention under the auspices of the New York Section. It will be held at the Hotel Pennsylvania, New York, on January 3rd, 4th and 5th, 1946. The tentative program is as follows:

Thursday, January 3rd

9:00 A.M. Registration
9:30-11:30 National Council Meeting
11:30-5:30 Research Sub-Committee Meetings
7:00 P.M President's Corporate Membership Dinner

Friday, January 4th

9:30-12:00 First Technical Session
General Subject: "War Problems and Their Peacetime Application"
12:00-2:00 Lunch for National Officers, Sectional Officers, Guest Speakers
2:00-4:30 Technical Session

Saturday, January 5th

9:30-12:00 General Research Meeting, open to all members
2:00-4:00 Intersectional Contest
7:00 Banquet
Award of Intersectional Prizes
Presentation of Olney Medal

This program, of course, is only tentative and subject to change. Further details will appear in the Reporter as developed.

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REPORT OF COMMITTEE ON TRANSFERENCE OF COLOR

THE finished charts for rating transference of color as received from the manufacturer were inspected and approved for delivery to the Association, and the entire 619 charts will be sent at once to Dr. Chapin for distribution as orders are received.

The Subcommittee believes that it has now fulfilled the major purpose for which it was formed, to produce a tool serving as an evaluating and rating device for the color transference component of all textile tests in which the staining of an undyed fiber is of importance. The task remaining before the committee is therefore that of assisting in the application of the chart in these test procedures. Our preliminary work in arriving at the final design of the chart showed that this method of rating color transference is valuable and advantageous in rating the results of sublimation, perspiration, washing, water, sea water, steaming, bleaching, dry cleaning, crocking and damp hot pressing tests, and there remains to be worked out only the specific translation of the numerical ratings given by the chart into varying degrees of acceptability or non-acceptability in fastness called for by accepted standards for the individual tests in question.

The committee will be glad to cooperate in the application of the chart to any of these tests, and recommends that the Director of Research call a meeting of the chairmen of the various subcommittees concerned prior to the next annual meeting in January 1946, so that plans may be initiated for the prompt utilization of this new tool in our standard test procedures. We believe that much of the preliminary work in application of the chart to these fastness tests may be carried out by the use of our Research facilities at Lowell.

The committee further recommends that the Director of Research notify the Standing Committee of CS59-44 that this chart is available so that concurrent steps may be taken to utilize it in their standard testing methods. We further suggest that all available means of publicity be used to inform those interested in the fastness properties of textiles that this tool, representing an advance in rating color transference, can be obtained, so that its use may become standardized throughout the industry.

D. P. KNOWLAND, *Chairman*
W. A. HOLST, *Secretary*

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REPORT OF COMMITTEE ON FLAMMABILITY OF CONSUMER TEXTILES

AT the June meeting our committee demonstrated the all automatic flammability tester, which had then just been completed. Possible errors by variations in operators' manipulations were eliminated in this instrument, and it was hoped at that time that the committee would soon be in a position to submit a satisfactory testing method. It had been decided to have five more of these testers constructed, which took more time to finish than originally anticipated. They were finally distributed about six weeks ago to:—

Lowell Textile Institute
National Bureau of Standards
J. C. Penney Company
Industrial Research and By-Products Co.
American Viscose Corporation
Princeton Knitting Mills

Together with the instruments were sent about one-half yard each of ten selected fabrics, which included knitrayons of different pile length, blankets, acetate and rayon net materials, cotton sheeting, and one Pyroxylin coated fabric. The laboratories conducted a series of prescribed tests with five samples of each fabric. However, when the results were compared at a committee meeting in New York, they showed unexpectedly poor correlation. It became quite evident that the reason was not the machine but variations in the individual fabric samples. In order to simplify further study, it was decided to work temporarily with one representative border-line brushed fabric, of which a considerable yardage was donated by Princeton Knitting Mills. Since it had been suspected varying humidity in the different test samples was the principle reason for the poorly correlated results, a large series of tests was conducted with widely varying conditions in this respect.

Best consistency was obtained when the samples were bone-dried for 15 minutes at 105° C., then cooled 3 minutes in a desiccator and immediately tested. This standardization, however, did not eliminate variations altogether. It was found that surface variations of the samples led to considerable differences in test results. For this reason, we are now studying the effects of uniform brushing before drying.

H. E. HAGER, *Chairman*

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REPORT OF THE COMMITTEE ON AGEING OF COTTON FABRICS

IT is fortunate in a committee as small as ours with each man pursuing his own individual bent, that the work of each has actually supplemented that of the others. For example, Mr. Appel is testing out the effect of different exposures, North versus South, 45° angle versus vertical exposure, etc. He also is interested in the influence of different fungicides on the life of the cotton fabrics so treated. He has some 1500 samples exposed, mostly in the hills of Maryland. Lt. McLeod at the Brooklyn Clothing Depot, on the other hand, is checking the fundamental question of just what radiation causes the maximum deterioration to cotton. His samples have been outdoors 6 months in 2 different locations and will be checked against controlled infra-red and ultraviolet radiation in his laboratory. Mr. Dean at the Southern Regional Laboratory has been working for several years on outdoor exposures and has developed an accelerated laboratory test which in 5 hours duplicates the effect of 3 months outdoors. The correlation is excellent on gray cloth; on treated samples for mildew resistance the correlation between outdoor and laboratory tests is sometimes good and sometimes not so good. Lastly Col. Steadman has an extensive program laid out and has been particularly helpful to others on the committee in supplying a standard cloth that all might use as a yardstick and he also runs fluidity measurements for those who are unable to test all their own samples. The committee has nothing startling to report, but is gradually building up a background of results which should lead to a satisfactory

accelerated test and to a truer picture of why and how cotton deteriorates on weathering.

KENNETH H. BARNARD,
Chairman.

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NEW YORK SECTION MEETING CANCELLED

The meeting of the New York Section, originally scheduled to be held on December 7th, 1945, has been cancelled.

Keep these dates open: January 3, 4 and 5, 1946

VICTORY CONVENTION

under auspices of

NEW YORK SECTION

NOTICE TO SECRETARIES OF LOCAL SECTIONS:

Please advise the National Secretary or the American Dyestuff Reporter of your meeting dates for the 1945-1946 season as soon as available.

● CALENDAR OF COMING EVENTS ●

Meeting, Rhode Island Section, Providence Engineering Society Hall, 195 Angell Street, Providence, R. I., October 26, 1945. Speakers: R. W. Jacoby, Ciba Co., Inc., "Some Aspects of Vat Dyeing"; O. W. Clark, Calco Chemical Division, American Cyanamid Co., "Some Fundamental Principles of Vat Dyeing."

Meeting, Philadelphia Section, November 30, 1945.

Victory Convention under auspices of New York Section, Hotel Pennsylvania, New York City, January 3rd, 4th and 5th, 1946.

Council Meeting, Hotel Pennsylvania, New York City, January 3, 1946.

Meetings of Sub-Committees of Research Committee, Hotel Pennsylvania, New York City, January 3, 1946.

President's Corporate Membership Dinner, Hotel Pennsylvania, New York City, January 3, 1946.

Research Committee Meeting, Hotel Pennsylvania, New York City, January 5, 1946.

Intersectional Contest, Hotel Pennsylvania, New York City, January 5, 1946.

Award of Olney Medal and Awards of Intersectional Contest Prizes, Hotel Pennsylvania, New York City, January 5, 1946.

Meeting, New York Section, Downtown Athletic Club, 19 West Street, New York City, February 1, 1946.

PERSONNEL SERVICE

Employers and members of the Association seeking employment can make appointments at the Victory Convention for interviews between noon on Thursday, January 3, and noon on Saturday, January 5.

Those seeking positions should file their qualifications well in advance of the meeting. Blanks can be obtained from the Secretary, P. O. Box 28, Lowell, Mass. Two photographs, approximately 2 by 2½ inches, will be required.

LAPEL BUTTONS at $1.50 each, may be purchased, by members in good standing, from the Secretary

UNEMPLOYMENT REGISTER

Members of this association, who are without employment, should forward a statement as to their qualifications and experience. This information will subsequently appear on these pages with an identifying key number. Employers are also requested to file with the American Dyestuff Reporter any vacancies which may occur in their business.

NOTICE TO EMPLOYERS

Personal Histories and Employment Records of the following applicants are on file at the office of the American Dyetuff Reporter. Prospective employers may examine them without obligation.

Key: A—Laboratory and research; B—Dyeing or printing; C—Finishing; D—Sales; E—Instruction; F—Executive.

A-2

Education—Graduate, Lowell Textile Institute, B.T.C., 1933.
Experience—Experienced as textile chemist, chemist-spotter, agricultural chemist and U. S. Army inspector on cotton, rayon, woolens and worsteds. Seeks research or control position with future. New England preferred.
Age 34; married; references.

A-3

Education—Ph.D. degree in chemistry, University of Lausanne, Switzerland. Knowledge of French, German and Russian.
Experience—Eleven years as assistant chemist and chemist in charge of laboratory with a large bleaching, dyeing, printing and finishing plant in New England. Experience in dyeing and printing cotton, rayons. Research. Five years with a textile testing laboratory of a mail order house in Midwest. Three years with an industrial research laboratory in vicinity of Boston.
Position desired in a laboratory in the East. References.

A-4

Education—B.T.C., Lowell Textile Institute, 1936.
Experience—One year as assistant to general manager in production of rubber coated textiles. Four years as assistant chemist working on the development and plant control of a number of rubber products including footwear, molded products, industrial rolls, tubing, etc. Seeks position as textile chemist or colorist or allied work.
Age 31, married; references.

A-B-1

Education—Bradford Durfee Textile School.
Experience—Eight years in dye laboratory testing dyes, matching shades, research work, trouble shooting combined with practical work on dyeing and bleaching. Two years as superintendent of dyeing, bleaching and drying. Had charge of laboratory and purchase of all materials for processing. Five years as dyer on cotton, rayon, silk and nylon. Seeks position as dyer, superintendent of dyeing and bleaching, or charge of dye laboratory.
Age 37, married, three children; references.

A-B-C-F-3

Education—High school and full apprenticeship.
Experience—Practical Dyer and finisher. Long experience on specialties for men's wear trouser trade in cottons, cotton and rayon mixtures and cotton and Celanese. Is disposing of interests in progressive finishing plant and seeks position as manager, assistant manager or technical advisor. Thoroughly understands requirements of Quartermaster, especially on herringbone construction.

A-D-1

Education—B.T.C., Lowell Textile Institute, 1922.
Experience—Three years as assistant chemist and chemist in bleachery. Twelve years as chemist with leather company, establishing laboratory, and handling purchasing of dyestuffs and chemicals. Seven years as sales engineer representing chemical company in New England for the textile and leather trades. Most recently associated with textile chemical company on sales and technical service of dyestuffs, soaps and chemical specialties. Seeks position as technical salesman.
Age 45; married, two children; references.

B-1

Education—2 years high school; 4 years dyeing, 2 years chemistry, Philadelphia Textile School.
Experience—16 years experience as a dyer in one concern. Experienced on auto cloth, wool, cotton, silk, rayon and mixtures of all kinds. Broad experience in field gained by experience in one large, wel-known mill qualifies this man, who is available for immediate employment as a dyer.
Age 37; married; 3 children; references.

B-C-1

Education—Lowell Textile Institute.
Experience—Many years of varied experience in charge of bleaching, dyeing, mercerizing, and finishing of cotton goods and rayon. Has a thorough knowledge of manufacturing, both technical and practical. Besides operation and processing, experience covers personnel management, supervision of building construction, machinery installation, production and costs. Seeks position as plant superintendent, technical engineer or consultant.
Age 65, married; references.

B-D-1

Education—Textile dyeing, college chemistry.
Experience—Over twenty-five years experience as dyer on various types of fibers and fabrics, dyestuff salesman, technical advisor on application of mildewproof and waterproof compounds and dyeing of casein fabrics. Seeks position as technical advisor and trouble shooter in viscose or protein fibers or as salesman of dyes or auxiliary compounds.
Age 47, married, four children; references.

B-D-3

Education—B.T.C., Lowell Textile Institute, 1939.
Experience—One year's experience as assistant dyer on wool felt hat bodies and raw stock, chemical control and research. Five years' experience as inspector of textiles for Q.M. depot, quality control and expediting in the finishing of cotton textiles. Seeks position as assistant superintendent, foreman, or in technical sales or research.
Age 28, married, three children; references.

C-1

Experience—Experienced as assistant finisher, finisher and superintendent of finishing since 1923. Experience on automobile cloth, boucle overcoatings, high grade men's wear worsted, low grade woolens, medium grade plaid-back overcoatings, fleece finish overcoatings. Bolivias, kerseys, medium-grade men's piece dye suitings, uniform cloth, flannels, ladies' dress goods and coatings, government serge and elastique fabrics, marine wool, flannel shirtings.
Age 37; married, 3 children; references.

Book Reviews—

(Concluded from Page 424)

grip the business world as normal competition returns and strives for public favor with attractive goods.

During the war period industry has been able to sell anything. With the revival of prewar conditions, the design pirate—that corsair of commerce—will stalk the avenues once more and seize artistic creations which individual genius and enterprise produce. The American system of opportunity and initiative will be imperilled.

Legal protection of original decorative designs virtually does not exist in this country although the Constitution specifically assures rewards for creativeness.

That great expounder of the Constitution, Justice Oliver Wendell Holmes, wrote stirring words to safeguard property rights in art-in-industry. But the evil of unauthorized copying remains uncontrolled. And the economic losses from piracy will continue to sap the spirit of the American Way unless a full-bodied movement succeeds in winning design protection.

This book is more than a vivid history of the struggle against design piracy. It is part of that continuing fight—a call to every suffering industry and an arsenal of information and techniques to serve the cause.

Sylvan Gotshal, New York attorney long identified with textile and retail interests, has had an active role in marshalling the anti-piracy forces these many years. His penetrating knowledge of the issues is compressed into a swift-running narrative in these lucid pages. The book is presented in the belief that a complete grasp of the facts concerning the campaign to stamp out piracy and attain protection will make it easier to build the world of the future toward which all of us turn with hope and eagerness.

As our nation has engaged in war to preserve American ideals, may we not look to public opinion, when peace comes, to sustain a united program of business integrity and social values?

WHAT THE FOREMAN NEEDS FOR SUCCESS

16 pages, Published by National Foremen's Institute, Inc., Deep River, Conn. 1945. Price 25 cents.

One of the biggest opportunities in the world faces foremen and supervisors today, an opportunity for vital service to their country, and an unequaled opportunity for personal success.

This booklet is an aid to acquiring the ability of getting people to work together.

The following are the titles of some of the sections: Adjusting Your Personality, Checking Yourself, Know Your Workers, Induction and Orientation, Lead Properly.

TEXTBOOK ON ORGANIC CHEMISTRY

By E. Wertheim. Professor of Organic Chemistry in the University of Arkansas. Second Edition. 967 pages, many illustrations and diagrams; also two colored cuts. Price $4.00. Published by The Blakiston Co., Philadelphia, 1945.

The fact that there were eight reprintings of the first edition of this book published in 1939, speaks well for its success, and gives it a permanent position among the leading text books on organic chemistry.

In its preparation the author has stressed the ideas of clarity, directness, convenience, and adaptability. To this end detailed description of individual compounds, with their physical constants have been omitted, but replaced by physical properties for the whole series of compounds and physical constants, given in tabulated form.

Salient facts are presented in as direct and concise a manner as possible; and important relationships between compounds and reactions have been emphasized by cross reference and the use of as much repetition as seems desirable.

Each chapter is followed by a long list of Literature References and an even longer list of Review Questions.

This book is now a well established text book on Organic chemistry. It is not only exceptionally well suited for students of the subject in general, but as a preliminary study for those who wish to take advance work in one of the numerous specialized branches of organic chemistry.

In this second edition the text material has been brought up to date and numerous aids to instruction have been added.

ABSTRACTS FROM CONTEMPORARY JOURNALS

NEWER FIBERS, Paul Larose, *Canadian Chemistry and Process Industries,* page 476, Vol. XXIX, No. 7, July, 1945.

This paper which was presented to the textile chemistry session of the Canadian Chemical Conference in Quebec on June 5th, 1945, discusses briefly some of the newer fibers such as the protein-derived Lanital, Aralac or Ardil, and nylon, Fortisan, Vinyon and glass. For purposes of comparison the natural fibers are discussed also.

Among the main requirements of a textile fiber the author includes the following: minimum length to allow it to be spun into a yarn with reasonable strength; minimum strength to stand manufacturing stresses and give it value for textile purposes; softness and suppleness; elasticity; resistance to creasing; ready recovery from distortion; resistance to repeated stresses. Natural fibers possess these properties in varying degrees; artificial fibers can be controlled within limits at will. Increasing knowledge of their structure will increase this control.

Stretching or drawing of the filament after it has been formed by the spinnaret is an important step upon which many of the properties of the fiber depend.

The material from which a fiber is produced must have a high molecular weight if it is to have strength, insolubility and general resistance to chemicals. A molecular weight of 10,000 or more is necessary. Carrothers found it necessary to produce polymers with a molecular weight of 10,000 in order to get a spinnable product. Vinyon requires a molecular weight of 15,000 to give a good fiber. Vinylidene chloride polymers for filament production have a molecular weight of around 20,000. Casein has been given a molecular weight of 70,000 to 100,000 but in the preparation of the fiber it is probable that degradation takes place resulting in a lower weight; the same is true in the case of rayon which has a lower molecular weight than the cellulose from which it is produced.

The tenacity of the fiber generally increases with the degree of polymerization up to a certain point, after which further polymerization is of little benefit. A high molecular weight alone is not enough to give strength to the fiber; the macromolecules must be in chain form if flexibility and elasticity are desired. In the synthetic fibers the polymers must be of the bifunctional type to give a linear

molecule or chain and form the minimum number of cross-linkages. The author further discusses the physical characteristics and constructions of the various fibers and effects on their properties. The solubility and dyeing properties are also discussed. It is pointed out that it is a fairly general rule that orientated fibers do not take up dyes as readily as do unorientated fibers. In conclusion the author states:

"Although many of the characteristics of fibers, physical or chemical, depend on structure, one must not lose sight of the fact that dimensions and configurations are very important in fibers. A continuous filament gives rise to a different fabric from that made with staple fibers. Stiffness depends to a large extent on diameter and cross-sectional shape of the fibers. Abrasion resistance, draping quality, appearance, feel, are all attributes of importance in textiles that are largely governed by the shape of the fibers. Here again the artificial fibers have some advantage over the natural fibers due to the variations that can be imparted. One can make hollow filaments, fine filaments, crimped filaments, ribbons, etc. The adaptability of synthetics is almost limitless.

THE PACKAGE DYEING OF NARROW FABRICS: A LINK BETWEEN YARN DYEING AND PIECE DYEING, H. A. Thomas, *The Journal of the Society of Dyers and Colourists,* page 185, Vol. 61, No. 8, August, 1945.

The author summarizes the contents of this paper as follows:

Preparing, dyeing and finishing operations conducted with rolls of narrow and wide fabrics in yarn package dyeing machines have given highly satisfactory results. Narrow fabrics provided the link between yarn package dyeing and piece package dyeing, all dyeings being on the same type of package dyeing machine. The technical and commercial advantages of dyeing narrow fabrics in roll form, compared with other methods of dyeing or with weaving from dyed yarn, have been outlined. If dyed in roll form, it is estimated that 4-5 per cent greater length of khali webbing is produced from a shipload of cotton, compared with that produced by weaving to the same specification web from hank dyed yarn of the same count. There is also less loss in weight on dyeing rolls of cotton webbing than during dyeing cotton yarn. A more uniform weave is usually obtained from grey yarn than from dyed yarn and there is less eye-strain in weaving grey yarn compared with dyed yarn. There are economies in transport, since the dyed rolls are in a condition suitable for dispatch direct to the consumer. There is no relaxation shrinkage or creep after dyeing the webbing in roll form. Webbing dyed in roll form is maintained in a flat condition, i.e., free from "curl," twist or "bow," whereas webbing dyed in hank form often contains kinks and other distortions, which necessitate wet finishing during re-blocking into roll form, as well as increased winding or blocking costs.

Certain loosely woven braids and ribbons are unsuitable for dyeing in roll or cheese form owing to distortion; they must be woven, knitted or braided from dyed yarn. Some high-class rayon ribbons must be finished after dyeing, but finishing from dyed rolls is a more satisfactory operation than finishing from dyed hanks.

Pressure dyeing of many tons of rolls of cotton webbing with vat dyes has been carried out . . ., in addition to the application of direct cotton dyes (both fast-to-light and washing," and ordinary types) and sulfur black. Success has not yet been achieved with other shades of sulfur dyes, owing to dark-colored impurities in the sodium sulfide (even when using crystal sulfide) or impurities in, or poor solubility of, the sulfur dyes. Azoic dyes also cause some difficulty owing to excess pigment on the surface of the rolls; soaping-off with the rolls slackly screwed down on the spindles to allow channelling of insoluble matter between the rolls effects some improvement, but it is obvious that some type of filter must be incorporated in the circulating system to deal with impurities and loose dye. All cotton webbing dyed in roll form with direct cotton dyes, or sulfur black, and all worsted tape dyed in roll form, is thoroughly penetrated, so that on cutting the webbing it has the appearance of having been woven from well-dyed yarn. Tape and thin cotton webbing have been thoroughly penetrated with vat dyes . . ., but a cross-section of vat dyed heavy or thick cotton webbing does not show complete penetration, although the shades are level and the penetration of the web adequate for the purpose.

The principles of selection of dyes and the technique of dyeing viscose rayon cakes, described by C. M. Whittaker (see REPORTER, July 3, 1944 and July 17, 1944), apply equally well to the package dyeing of narrow and wide fabrics in roll form, as shown by the success which has attended this development, and this helped to forge the link between yarn dyeing and piece dyeing. There would have been no link, however, had not the principle of slack rolling been discovered. This permits of channelling of dye liquor between laps of webbing or broadcloth and is contrary to the usually accepted doctrine and procedure of building a package so that channelling of dye liquor cannot occur, e.g., tight selvedges in a roll of fabric.

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Buying
and
HOLDING
Bonds!

MECHANISM OF FELTING OF WOOL FIBERS, L. Bohm, *Nature* 155, 547-548; through *J. Soc. Dyers and Col.*

The coefficients of friction of wool fibers when rubbed from root to tip and from tip to root have been measured in various media in order to obtain a measure of the "directional frictional effect" (D.F.E.) (cf. Martin, *J. Soc. Dyers and Col.*, 1944, 60, 325). Variations in the felting rate in unbuffered solutions having different pH are directly related to changes in the D.F.E. Treatment of wool with benzoquinone or mercuric acetate, which has recently been claimed by Speakman and Barr (*ibid.*, 1944, 60, 335) to reduce the felting power of the wool solely by modifying its elastic properties, also causes a very considerable reduction in the D.F.E. and apparently all known anti-felting treatments cause diminution in this property. The low felting power of wool in non-aqueous media is due to their inability to enhance the D.F.E. Their peculiar frictional properties are the principal, if not the governing, factor in the felting of wool fibers.

USE OF ABRASIVES TO MAKE WOOL UNSHRINKABLE, J. B. Speakman and E. Whewell, *J. Textile Inst.*, 1945, 36, T48-56; through *J. Soc. Dyers and Col.*

Wool fabrics are made unshrinkable by impregnating them with oil and a finely divided abrasive, followed by mechanical working in a milling machine so that the scale edges of the fibers are removed. The effectiveness of the abrasive increases with fineness and hardness, and the highest degree of unshrinkability was obtained by using 200-mesh (I.M.M.) silica. Thus, the area shrinkage of a light-weight woolen flannel (146.5 g.) after treatment for 1 hr. in the presence of 43.3 g. of 200-mesh (I.M.M.) silica and 217 ml. Topsol combing oil, was 19.0 per cent, compared with 49.3 per cent for the untreated flannel. This method of making wool unshrinkable establishes the fundamental role of the surface scale structure of animal fibers in milling shrinkage.

OBITUARY

JOHN ADRIAN

JOHN ADRIAN, 51, special representative of Sylvania Industrial Corporation, died on October 8 at Stamford hospital in Stamford, Connecticut following a short illness.

Mr. Adrian was a native of Taunton, Massachusetts and had been with Sylvania Industrial Corporation for many years, on leave for two years during the war to work with the Chemicals Bureau of the War Production Board in Washington.

Surviving are his wife, two sons, and a daughter.

WALTER W. LANE

MASTER SGT. WALTER W. LANE, of the Second Armored Division, for many years a resident of Philadelphia, died September 24th at the Walter Reed Hospital, Washington, D. C., after a long illness contracted during his service in Europe.

Prior to his entry into service, Sgt. Lane was in charge of the Philadelphia office of the Warwick Chemical Co. He was 28 years old; is survived by a wife, his parents and a sister.

• ARIDYE APPOINTMENTS

Aridye Corporation, Fair Lawn, N. J., announces that Kenneth J. Broden was recently appointed New England District Manager. William A. Green, who joined the Company on June 1 as a member of the staff of the Application Laboratories has been appointed technical representative with headquarters in Providence, R. I.

• MODERN pH AND CHLORINE CONTROL

A completely revised edition of the Taylor combination handbook and catalog, contains both simple and technical explanations of the meaning of pH control; specific discussions of the application of pH, chlorine and phosphate control to 35 industries; the precautions to be observed in making determinations; and descriptions of all Taylor outfits, including 8 new sets. A copy is available on request to W. A. Taylor & Co., 7300 York Road, Baltimore 4, Md.

• MANUAL ON QUADRAFOS

"Better Washing with Quadrafos" is the title of the new 22-page manual for laundry operators just prepared by Rumford Chemical Works. This free manual, available from leading distributors of laundry supplies or Rumford Chemical Works, tells how to speed rinsing, save up to 30 per cent soap, reduce bleach, prevent greying, soften water without alkalies, improve bluing and starching—problems that confront every laundry operator.

• HERCULES PERSONNEL CHANGES

Three personnel changes in Hercules Powder Company's Cellulose Products Department were announced recently by J. B. Wiesel, director of sales and development for the department.

The three changes are: LeRoy T. Barnette, named supervisor of branch offices; J. K. Speicher to be assistant technical service manager; and L. C. Kleinhans, appointed manager of the department's New York office.

• REPORT ON ORGANIC CHEMICALS

The United States Tariff Commission issued recently a preliminary report on production and sales in 1944 of synthetic organic chemicals and the raw materials of wnich they are made. Tne report includes statistics for tars, chemical crudes derived from coal tar and petroleum, intermediates, and such finished products as dyes, color lakes and toners, medicinals, flavor and perfume materials, plastics materials, rubber-processing chemicals, and miscellaneous chemicals. Detailed statistics for surface-active agents and for plasticizers are shown in separate tables, the first time this has been done in the Commission's reports.

Copies of the preliminary report may be obtained from the United States Tariff Commission, Washington 25, D. C., or from the Commission's office in the Custom House, New York 4, New York.

A final report giving complete figures received from all of the companies producing synthetic organic chemicals and including a list of the manufacturers will be issued in printed form early in 1946.

• REFLECTANCE STANDARDS

The National Bureau of Standards is now prepared to issue sets of white, gray and black reflectance standards. Each set contains ten calibrated porcelain-enameled panels which diffusely reflect approximately 80, 70, 60, 40, 20, 15, 8, 4, 0.8, and 0.5 per cent, respectively, of the light that strikes them. They are 4 x 4 inches in size and have folded edges to minimize warpage resulting from enameling.

These standards are intended primarily for use with reflectometers used to measure paints, papers, textiles, ceramic products, and other opaque materials for reflectance and approximate color by the photoelectric tristimulus method. As was pointed out in NBS Circular C429 (July 1942) on photoelectric tristimulus colorimetry, accurate chromaticity measurements are possible only when samples and standard are spectrally similar. For this reason, accurate measurements of the colors of only near-white, near-gray and near-black materials are possible with the new standards. They are intended primarily for use with the multipurpose reflectometer developed at the National Bureau of Standards (J. Research NBS 25, 581 (Nov. 1940) RP1345), and with other reflectometers used to measure 45° 0° directional reflectance.

Each set is calibrated with the blue, amber and green filters described in NBS Circular C429, and is packed in a permanent, hinged-top, wooden box. The fee to non-government agencies is $50.00 a set.

• JOINS GEIGY

Geigy Co., Inc. of 89 Barclay St., New York, originators of DDT Insecticides, announces that Melvin Goldberg, formerly a WPB executive, has just joined the organization.

For the past four years until October 1st, Mr. Gold erg has been chief of the Insecticides and Fungicides Unit of the Chemical Bureau, War Production Board. His activities during the war were particularly related to DDT, pyrethrum, rotenone and the arsenicals.

Prior to his WPB work, Mr. Goldberg conducted research for the United States Bureau of Animal Industry and for the United States Health Service. He holds degrees from Johns Hopkins and Georgetown.

• APPOINTED NYLON MANAGER

Robert L. Richards, who has been assistant manager of the Cellophane Division since May 1, 1944, has been appointed manager of the Nylon Division, it was announced recently by E. I. du Pont de Nemours & Company. He succeeds Charles A. Cary, whose appointment as assistant general manager of the Rayon Department was announced this week.

Arlington Kunsman, director of production of the Rayon Division since December 1, 1937, succeeds Mr. Richards as assistant manager of the Cellophane Division. The appointments are effective immediately.

• AMERICAN VISCOSE PERSONNEL CHANGES

A number of changes in the organization of the American Viscose Corporation's sales divisions, effective October 1, have been announced by William B. Olmsted, Jr., general sales manager.

The viscose rayon yarn sales division will be managed by William G. Luttge, formerly in charge of high-tenacity yarn sales. The assistant manager will be Malcolm V. MacFarland, previously deputy director of the Textile and Leather Bureau of WPB. Additions to the division's staff will include Murray H. Morse, formerly manager of the company's Philadelphia sales office, and Sidney Creveling, returning from the Army.

George L. Storm, returning from the Navy, and previously in charge of acetate rayon yarn sales, will be manager of the staple fiber and waste sales division, with Standish W. Holmes as assistant manager. Three returning servicemen, S. Reed Anthony, C. David Reich and MacLean Williamson, will be added to the division's staff.

John C. Wilmerding, returning from the Navy, will be manager of the acetate and "Vinyon" sales division, with Benoni J. Truslow as assistant manager. Thomas H. Andrews, who has returned from his duties as chief of the synthetic yarn section of WPB, will be in this division in charge of "Vinyon." Three returning servicemen, Charles J. Mills, John A. Coleman and Daniel A. Davis, will be added to the division's staff.

Louis A. Welch has been appointed assistant manager of the New York district sales office under J. H. Hammes. Edward H. Look, returning from the Army, will become a member of the staff.

Jean P. Mervine, of the staple fiber sales division and previously of the Philadelphia office staff, has been appointed manager of the Philadelphia sales office, succeeding Murray H. Morse, who is transferred to the viscose yarn sales division in the New York office. Laurence H. Nolte of the Philadelphia office has been appointed assistant manager, and Frederick Fowler and John Wiggins, previously of the Philadelphia office, will rejoin the staff when they return from service.

Henry K. Kelly has been appointed assistant manager of the Charlotte, N. C., sales office, under Harry L. Dalton. Norman A. Cocke, William K. Davis and Alex S. Hanes, returning from the services, and Robert Johnson, will be added to the staff. It is expected that a new sales office, directed from Charlotte, will be established at Atlanta, Ga.

Robert E. Smith has been appointed assistant manager of the Providence, R. I., sales office, under Robert F. Thayer. Returning servicemen who will be attached to this office are John C. Folsom, previously of the Philadelphia office, and Stanley G. Haskins and Cyril Sumner, previously of the Providence office.

Plans are being made to establish a new sales office in Cleveland, Ohio, which will be in charge of William J. Bieberle, currently of the Philadelphia sales office. The assistant manager will be Harry A. Mason, at present a member of the viscose rayon yarn sales division in the New York office, where he has been in close contact with the tire manufacturing companies in connection with sales of rayon tire yarn.

● WARWICK CHEMICAL FOUNDATION

Ernest Nathan, President of the Warwick Chemical Company, recently announced the establishment of the Warwick Chemical Foundation in memory of the company employees who lost their lives during the war.

The major purpose of the Foundation is to promote education and research in chemistry by providing scholarships to graduate chemistry students in several colleges throughout the country. One scholarship, known as the Walter Nowicki Scholarship, will be established at Rhode Island State College and another, the Manfred Caranci Scholarship, will be awarded to some Southern school.

All scholarship awards run for the duration of one year and will be conferred by the chemistry departments of the colleges in conjunction with the trustees of the Foundation. All results of the research, Mr. Nathan said, are to be confined to the best interests of the colleges.

As yet no announcement has been made of the individual recipients of the initial Warwick Chemical Foundation awards. However, the trustees of the Foundation are presently selecting a committee for this purpose.

● INDEX FOR CALCO BULLETINS

Calco Chemical Division, American Cyanamid Company, Bound Brook, N. J., announces the release for distribution of an Index to Calco Technical Bulletins. They state: "The increasing number of inquiries for our technical bulletins has indicated a need for a reference index to the valuable material contained in the numerous bulletins issued to date. A short abstract of the subject matter of each bulletin has been prepared to provide the reader with a key to the information contained in the various bulletins. And since the work of our Research and Technical Service Laboratories has been conducted in many industrial fields having totally unrelated products and problems, it seemed advisable to list the different bulletins with their abstract under the product materials or the subject they treat upon."

A copy of "Index to Calco Technical Bulletins" issued under Calco Technical Bulletin No. 761 may be obtained by writing the Advertising Department, Calco Chemical Division, American Cyanamid Co., Bound Brook, N. J.

● JOINS ZINSSER & CO.

Zinsser & Company, Inc. of Hastings-on-Hudson, New York, announces that Roderick M. Ladd has joined their Chemical Sales Staff.

Mr. Ladd, after graduating from Dartmouth College in 1937, was associated with Innis, Spieden & Company in both Chicago and Cleveland. Later he sold for the Hooker Electrochemical Company in New York. During the war Mr. Ladd served with the New York Procurement Office of the Chemical Warfare Service.

● ANNUAL MEETING, T. R. I.

The 16th annual meeting of the Textile Research Institute will be held Friday, November 9, in New York at the Waldorf-Astoria Hotel commencing with a business meeting for Institute members at 9 a.m. The morning technical session from 10:30 to 12:30 will be devoted to the Fundamental research work of the Textile Foundation at Princeton, N. J., in which five T. R. I. graduate fellows are participating. Reports will be given of research concerned with the mechanical properties of textiles and also on the oxydative degradation of cellulose. In connection with the latter subject some important conclusions have been reached with respect to the action of soaps and other detergents on oxydized cellulose.

Luncheon will be served at 12:45 and will be followed by an address by Prof. H. D. Smyth, Chairman of the Department of Physics, Princeton University, who is author of the official report on the development of the atomic bomb, whose subject will be "Atomic Energy."

The afternoon session, commencing at 2:30, will be devoted to a technical program conducted by the research staff of the Institute. The papers will include the following subjects: "A Method of Correlation of Equilibrium Moisture Regain in Textile Fibers: Theoretical and Industrial Implications" and "Progress Report on Radiation Drying of Textiles."

Non-members of the Institute are welcome and are invited to attend the technical sessions and luncheon. Those who are interested may obtain information by writing Textile Research Institute, Inc., 10 E. 40th Street, New York 16, N. Y. Luncheon tickets will be $5.00 and should be obtained in advance.

● JOINS GEORGE MANN & CO.

George Mann & Co., Inc., Distributors of Heavy Chemicals at Providence, R. I. and Stoneham, Massachusetts, have engaged Edward A. Whalen as a technical representative in charge of service.

Mr. Whalen is a graduate of Providence College, 1935, with a B.S. degree in chemistry. During 1936-1940 he was a mill

chemist at the Cranston Print Works, Webster, Massachusetts. During 1940-1945 he was control chemist and technical representative for Alrose Chemical Company, Cranston, R. I. He is a member of the R. I. Section of the American Association of Textile Chemists and Colorists.

• JOINS WARWICK

The Warwick Chemical Co. recently announced that Oliver L. Bennett, formerly of Riverside and Dan River Mills, Danville, Va., has joined the technical sales staff of their Rock Hill, S. C. plant.

Oliver L. Bennett

Mr. Bennett, a native of South Carolina, was educated at Clemson College and served his apprenticeship with Pacific Mills, Lyman, S. C. He was subsequently associated with Southern Bleachery, Taylor, S. C., and the Trion Co., Trion, Ga.

The Warwick Chemical Co. has assigned Mr. Bennett to the Southern territory with headquarters at the Rock Hill plant, where he will act as technical consultant to the company's sales staff.

• NUODEX APPOINTMENT

Harold M. Johnson, vice president in charge of sales, of the Nuodex Products Co., Inc., Elizabeth, N. J. announces the appointment of Edward Salas as manager of the company's newly formed Market Development Division.

Preparation for the expansion of Nuodex in the postwar era has created a need for the new division which will be responsible for sales promotion, advertising, sales analyses and customer research, according to Mr. Johnson.

Mr. Salas formerly handled sales promotion for the Keystone Varnish Company, Brooklyn, N. Y. He is a graduate of New York University, where he specialized in advertising and marketing, and had been connected with the Keystone organization for the past seven years.

• PURCHASES K & S CHEMICAL CO.

Stanford L. Hermann, operating vice-president of the Apex Chemical Co., Inc., 200 South First Street, Elizabeth, N. J., has announced the purchase of all installations, equipment, and laboratories of the K & S Chemical Company, formerly of 44 Cliff Street, New York City, a manufacturer of fine chemicals, drugs, and pharmaceuticals. This equipment has now been installed in Elizabeth and the manufacture of these organic synthetics on a commercial basis is now under way.

Sidney M. Weinstein, director of research, and Dr. Philip Levine, head of the organic division, have been assigned to the development and production of these various organicals. Chemicals originally produced by the K & S Chemical Company, as well as any other fine organicals can be secured by contacting the sales office of the Apex Chemical Company at 225 West 34th Street, New York City. Inquiries are solicited.

• TO INSTALL LABORATORY

A quality control testing and research laboratory will be ready for operation on November 1, 1945 at the California, Missouri plant of Moniteau Mills, Inc.

The laboratory will be equipped and staffed by the United States Testing Company, Inc. and will conduct necessary tests to accurately control the quality of the materials through all stages of manufacture.

Moniteau Mills is one of the first of a series of industrial plants that will have laboratories equipped and run by the Testing Company.

• MONSANTO APPOINTMENTS

Appointment of H. J. Heffernan as assistant general manager of sales of Monsanto Chemical Company's Merrimac Division, effective September 1, has been announced by D. S. Dinsmoor, divisional general manager.

Mr. Heffernan entered Monsanto's service as a salesman in 1926, and since 1929 has been branch manager of the division's New York office.

He succeeds the late Horace Burrough III, who died August 9, and is in turn succeeded by W. E. Drown, his assistant in the New York office.

Also announced was the promotion of J. J. McCarthy from the Development Department to the Division Sales Department as manager of textile sales development.

Three assistant sales managers were advanced to the position of sales managers of their respective departments. They are:

W. R. Minchin, who becomes sales manager of the Heavy Chemicals Department of the division.

T. C. Jesdale, who is named sales manager for Organic and Phosphate Division products at Merrimac Division.

P. O. Huntington, now acting as assistant sales manager, who will become sales manager of the Merrimac Division's Alcohol Department.

• ISOPROPANOLAMINE AVAILABLE

Mixed Isopropanolamine is now available from Carbide and Carbon Chemicals Corporation. Manufacturers of emulsified finished products, particularly those where the color of the finished product is important, will be interested in mixed isopropanolamine.. It is claimed that laboratory tests have definitely proved that under normal storage conditions, mixed isopropanolamine soaps are more resistant to darkening than are ethanolamine soaps. Because mixed isopropanolamine soaps are completely oil-soluble, they are desirable, also, in "soluble" textile and metal cutting oils as well as drycleaning soaps. This amine product, which is a viscous, hygroscopic liquid with a slightly ammoniacal odor, is completely soluble in water, but only slightly soluble in hydrocarbons. The combining weight of mixed isopropanolamine is 135 to 145, or approximately the same as that of triethanolamine, and for this reason it may be substituted weight for weight in most formulas calling for triethanolamine. Further information on mixed isopropanolamine can be obtained by writing Carbide and Carbon Chemicals Corporation, 30 East 42nd Street. New York 17, N. Y.

• JOINS PROVIDENCE CHEMICAL

Maurice A. Lewis, unit chief for glycols and Amines in the Plasticizers Section in the Chemical Bureau, joined the Providence Chemical Company on October 1st as sales manager. This newly formed company is a subsidiary of the Providence Textile Chemical Company and will extend its efforts to industry other than textiles. Mr. Lewis was Chemical Sales Director for Doe & Ingalls, Inc. for twenty-four years prior to his connection with the War Production Board. Before that time he had been with Howe & French Company and E. I. du Pont de Nemours.

• TO JOIN FABRIC RESEARCH

Dr. Simon Williams, director of research for the National Cotton Council of America will become an associate director of research of Fabric Research Laboratories, Inc., Boston, Massachusetts, in December of this year.

From 1940 to 1943, Dr. Williams served as assistant professor of chemical engineering in the Bureau of Industrial Chemistry at the University of Texas, where his duties involved graduate instruction and research direction in the chemical engineering field. While at the University of Texas, Dr. Williams was associate di-

rector of the Bureau of Industrial Chemistry at the University in charge of the Cotton Textile Division. In 1943, he was appointed director of research of the National Cotton Council of America from which position he resigned to join the staff of Fabric Research Laboratories, Inc.

His current research activities cover studies of cottonseed products, investigations of cotton genetics, fundamental studies on biological degradation of cotton, application of high polymers to cotton fibers prior to spinning and weaving, fabric structure and properties relationships in plastic laminates, as well as other textile technological investigations and studies in cotton blending.

He is a member of the Society of the Sigma Xi, Phi Kappa Phi, American Chemical Society, American Society for Testing Materials, American Association of Textile Chemists and Colorists and the Industrial Fiber Society.

He is also a member of the executive board of the Inter-Society Council for Textile Research and a member of the Advisory Panel of the Southern Regional Research Laboratory, U.S.D.A. at New Orleans, Louisiana.

• JOINS BJORKSTEN LABS.

Kenneth Sutherland has joined the staff of Bjorksten Laboratories, 185 N. Wabash Avenue, Chicago, as a chemist. Mr. Sutherland was previously associated with Turco Products, Inc.

• CAREERS FOR CELLULOSE

The Hercules Powder Company's industrial film, "Careers for Cellulose," which traces the manufacture of cellulose plastics from the cotton field to the finished plastic article, will be shown in 20 Latin American countries by the Office of Coordinator of Inter-American Affairs.

Starting out with the cotton fields, the film then shows the cotton being transformed into cellulose and other bases for plastics, lacquers, film, rayon, and other articles, at Hercules chemical plants in Parlin, N. J., and Hopewell, Va.

From these chemical plants, the film follows the cellulose materials to Hercules testing laboratories where the cellulose materials are given numerous tests by unusual machines.

The remainder of the film shows the actual manufacture of plastics and demonstrates the wide possibilities of cellulose materials in a variety of industries as well as its many applications in newer plastic developments.

Prints of the film are available without cost for exhibition in this country from Hercules' Cellulose Products Department, Wilmington, Del.

• CLASSIFIED ADVERTISEMENTS •

The rate for "Position Wanted" advertisements in this column is 2 cents a word—with a minimum of 50 cents per insertion. For all other types of advertisements—i.e., help wanted, machinery or supplies for sale—the rate is $6.25 per column inch or less per insertion.

WANTED TECHNICAL SALES ASSISTANT: Rare opportunity to become permanently connected with nationally recognized manufacturer of textile processing specialties. Prefer graduate of textile institute with mill experience. Will act as assistant to District Manager covering Pennsylvania, Maryland, Delaware, Virginia. Salary plus bonus. Write giving complete educational and business background. Replies held in strict confidence. Our organization knows of this advertisement. Box 748.

POSITION WANTED: Married man 37 years old with 17 years bleaching, dyeing and finishing cotton and rayon piece goods experience, 5 years as plant supervisor in small finishing mill, at present overseer of dyeing in large mill desires a change. Box 755.

WANTED: Textile chemist for research work—both laboratory and field work. Permanent position. Excellent opportunities. Write for application. Location Upstate New York. Box 756.

WANTED: Assistant Dyer by National Hosiery Mills, Inc., Indianapolis, Indiana. Preferably man 25 to 35 years of age. Man with experience in Chemistry and Dyeing preferred. Contact J. A. Goodman, President.

WANTED: Junior Colorist. A young man with dyeing, printing or dyestuff experience, by technical laboratory on synthetic fibers in New York City. Excellent long range future. State age, education, experience, and salary desired. Our own employees know of this ad. Information will be held in confidence. Box 761.

WANTED: Textile school graduate experienced in weave construction and practical mechanical factory operation desired by American owned South American Rayon Weaving Mill. Write giving background, education, snapshot and expected salary. Box 762.

WANTED: Textile chemist experienced in synthesizing detergents, wetting agents, etc. Responsible position, Metropolitan New York. State salary requirements. Box 763.

WANTED: A corporation with a good national reputation desires to employ an engineering chemist to be *trained* to take charge of a bleachery located in the South. Although some experience in bleaching and finishing would be helpful, it is not a requisite for the position. Educational requirements are: C.E. degree or industrial chemistry relating to textile manufacturing. The accepted applicant will be trained in the company's existing bleacheries. Box 764.

WANTED: Salesman with knowledge of dyestuffs and textile auxiliaries, for New England area. Unlimited opportunity for one with following. Give ample qualifications. All replies confidential. Box 765.

WANTED: Experienced Technician, Colorist, Chemist. A man experienced in the application of all classes of dyestuffs. Position in Laboratory of large rayon manufacturer. Location—Metropolitan area. Replies will be treated with strict confidence. State particulars. Box 766.

-:- *Use Reporter Classifieds for Results!* -:-